

Claims

1. A method of analyzing the compositions of defects, the method comprising the steps of:

 moving a stage and setting a sample placed on the stage to an observation position;

 obtaining a secondary particle image of a first resolution of the sample by irradiating and scanning a first electron beam focused on the sample set at the observation position and detecting secondary particles emitted from the sample;

 determining the position of a defect on the sample using the secondary particle image of the first resolution of the sample;

 obtaining a secondary particle image of a second resolution of the sample by irradiating and scanning an electron beam focused on the determined position of the defect and detecting secondary particles emitted from the sample;

 obtaining information of a defect region on the sample using the secondary particle image of the second resolution of the sample;

 selecting a target defect to be analyzed on the basis of the obtained information of the defect region; and

 obtaining information of the composition of the target defect by irradiating a second electron beam focused on the selected target defect and analyzing the selected target defect.

2. The method of analyzing the composition of defects of

claim 1, wherein the secondary particle image of the second resolution has a higher resolution than that of the secondary particle image of the first resolution.

3. The method of analyzing the composition of defects of claim 1, wherein during the step of determining the position of the defect, the position of the defect on the sample is determined by comparing secondary particle images of the first resolution of the sample obtained by irradiating and scanning the first electron beam and detecting secondary particles emitted from the sample.

4. A method of analyzing the composition of defects, the method comprising the steps of:

moving a stage and setting a sample placed on the stage to an observation position;

obtaining an image of the sample by irradiating and scanning an electron beam focused on the sample set at the observation position;

determining the positions of plural defects on the sample from the image of the sample;

acquiring magnification images of the plural defects by irradiating and scanning an electron beam focused on the basis of the determined position information;

extracting a target defect to be analyzed on the basis of the magnification images of the acquired plural defects; and

analyzing the extracted target defect to obtain information of the composition of the target defect.

5. The method of analyzing the composition of defects of claim 4, wherein during the step of acquiring the magnification images, the magnification images are acquired so that an image of the defects determined on the basis of the information of the determined positions of the defects is positioned in the center.

6. The method of analyzing the composition of defects of claim 4, further comprising the step of classifying the plural defects using the acquired magnification images of the plural defects, wherein during the step of extracting the target defect to be analyzed, the target defect to be analyzed is extracted on the basis of the acquired magnification images of the plural defects and information obtained by classifying the plural defects.

7. The method of analyzing the composition of defects of claim 4, wherein during the step of obtaining the information of the composition of the target defect, the extracted target defect is analyzed using an energy dispersive X-ray spectrometer (EDX).

8. The method of analyzing the composition of defects of claim 4, wherein during the step of obtaining the information of the composition of the target defect, the extracted target defect is analyzed using Auger electron spectroscopy.

9. The method of analyzing the composition of defects of claim 4, further comprising the step of displaying, on a same screen, the acquire magnification images and the obtained information of the composition of the target defect.

10. A method of analyzing the compositions of defects, the method comprising the steps of:

moving a stage and setting a sample placed on the stage to an observation position;

obtaining an image with a scanning electron microscope (SEM image) of a first resolution of the sample by irradiating and scanning an electron beam focused on the sample set at the observation position;

determining the position of a defect on the sample using the SEM image of the first resolution of the sample;

acquiring an SEM image of a second resolution, which is higher than the first resolution, of the sample on the basis of the determined position information of the defect;

obtaining an image of a region of the defect from the acquired SEM image of the second resolution of the sample;

selecting a target defect to be analyzed using the obtained image of the region of the defect; and

obtaining information of the composition of the target defect by analyzing the selected target defect.

11. The method of analyzing the composition of defects of claim 10, wherein during the step of determining the position

of the defect, the position of the defect on the sample is determined by comparing secondary particle images of the first resolution of the sample obtained by the SEM image of the first resolution.

12. The method of analyzing the composition of defects of claim 10, wherein during the step of acquiring the SEM image of the second resolution, the SEM image of the second resolution is acquired so that the image of the defect determined on the basis of the determined information of the position of the defect is positioned in the center using the SEM image of the first resolution.

13. The method of analyzing the composition of defects of claim 10, further comprising the step of classifying the plural defects using the acquired magnification images of the plural defects, wherein during the step of extracting the target defect to be analyzed, the target defect to be analyzed is extracted on the basis of the acquired magnification images of the plural defects and the information obtained by classifying the plural defects.

14. The method of analyzing the composition of defects of claim 10, wherein during the step of obtaining the information of the composition of the target defect, the extracted target defect is analyzed using an energy dispersive X-ray spectrometer (EDX).

15. The method of analyzing the composition of defects of

claim 10, wherein during the step of obtaining the information of the composition of the target defect, the extracted target defect is analyzed using Auger electron spectroscopy.

16. The method of analyzing the composition of defects of claim 10, further comprising the step of displaying, on a same screen, the acquire SEM image of the second resolution and the obtained information of the composition of the target defect.

17. A device for analyzing the compositions of defects, the device comprising:

stage means for placing a sample thereon and setting the sample at an observation position;

secondary particle image acquiring means for obtaining a secondary particle image of a first resolution of the sample by irradiating and scanning an electron beam focused on the sample set at the observation position by the stage means and detecting secondary particles emitted from the sample;

defect detecting means for determining the position of a defect on the sample using the secondary particle image of the sample acquired by the secondary particle image acquiring means;

position information acquiring means for obtaining information of a defect region on the sample from the secondary particle image of a second resolution of the defect obtained by irradiating and scanning the electron beam focused on the position of the defect determined by the defect detecting means

and detecting the secondary particles emitted from the sample with the secondary particle image acquiring means;

defect selecting means for selecting a target defect to be analyzed on the basis of the information of the defect region obtained with the position information acquiring means;

analyzing means for analyzing the target defect selected by the defect selecting means to obtain information of the composition of the target defect; and

display means for displaying the secondary particle image of the second resolution of the defect acquired with the position information acquiring means and the information of the composition of the target defect obtained by analyzing the target defect with the analyzing means.

18. The device for analyzing the composition of defects of claim 17, further comprising defect classifying means for classifying the defect using the secondary particle image of the second resolution of the defect acquired with the position information acquiring means, wherein the defect selecting means the target defect to be analyzed on the basis of the information of the defect region acquired by the position information acquiring means and the information obtained by analyzing the defect with the defect classifying means.

19. The device for analyzing the composition of defects of claim 17, wherein the analyzing means is disposed with an energy dispersive X-ray spectrometer (EDX).

20. The device for analyzing the composition of defects of claim 17, wherein the analyzing means is disposed with an analyzer using Auger electron spectroscopy.

21. A device for analyzing the compositions of defects, the device comprising:

stage means for placing a sample thereon and setting the sample at an observation position, the stage means being movable in at least one axial direction;

SEM image acquiring means for obtaining an SEM image of the sample set at the observation position by the stage means;

defect detecting means for determining the position of a defect on the sample using the SEM image of a first resolution of the sample acquired by the SEM image acquiring means;

defect region information acquiring means for obtaining an image of a region of the defect from the SEM image of a second resolution of the defect acquired by the SEM image acquiring means on the basis of the position information of the defect determined by the defect detecting means;

defect selecting means for selecting a target defect to be analyzed using the image of the region of the defect obtained by the defect region information acquiring means;

analyzing means for analyzing the target defect selected by the defect selecting means to obtain information of the composition of the target defect; and

outputting means for outputting the information of the

composition of the target defect obtained by analyzing the target defect with the analyzing means.

22. The device for analyzing the composition of defects of claim 21, wherein the analyzing means is disposed with an energy dispersive X-ray spectrometer (EDX).

23. The device for analyzing the composition of defects of claim 21, wherein the analyzing means is disposed with an analyzer using Auger electron spectroscopy.